FLUVIEW
A Weekly Influenza Surveillance Report Prepared by the Influenza Division

2015-2016 Influenza Season
Week 52 ending January 2, 2016

All data are preliminary and may change as more reports are received.

Synopsis: During week 52 (December 26, 2015-January 2, 2016), influenza activity increased slightly in the United States.

- **Viral Surveillance**: The most frequently identified influenza virus type reported by public health laboratories during week 52 was influenza A, with influenza A (H1N1)pdm09 viruses predominating. The percentage of respiratory specimens testing positive for influenza in clinical laboratories was low.
- **Novel Influenza A Virus**: One human infection with a novel influenza A virus was reported.
- **Pneumonia and Influenza Mortality**: The proportion of deaths attributed to pneumonia and influenza (P&I) was below their system-specific epidemic threshold in both the NCHS Mortality Surveillance System and the 122 Cities Mortality Reporting System.
- **Influenza-associated Pediatric Deaths**: Two influenza-associated pediatric deaths were reported.
- **Outpatient Illness Surveillance**: The proportion of outpatient visits for influenza-like illness (ILI) was 2.8%, which is above the national baseline of 2.1%. Seven of 10 regions reported ILI at or above region-specific baseline levels. Puerto Rico and two states experienced high ILI activity; New York City and two states experienced moderate ILI activity; seven states experienced low ILI activity; 39 states experienced minimal ILI activity; and the District of Columbia had insufficient data.
- **Geographic Spread of Influenza**: The geographic spread of influenza in Guam and two states were reported as widespread; six states reported regional activity; 13 states reported local activity; the U.S. Virgin Islands and 27 states reported sporadic activity; the District of Columbia and two states reported no influenza activity; and Puerto Rico did not report.

National and Regional Summary of Select Surveillance Components

HHS Surveillance Regions*	Data for current week			Data cumulative since October 4, 2015 (week 40)						
	Out-patient ILI†	Number of jurisdictions experiencing high or moderate ILI activity§	% respiratory specimens positive for flu in clinical laboratories‡	A(H1N1) pdm09	A (H3)	A (Subtyping not performed)	B Victoria lineage	B Yamagata lineage	B lineage not performed	Pediatric Deaths
				Influenza test results from public health laboratories only						
Nation	Elevated	6 of 53	1.8%	290	437	44	22	73	115	6
Region 1	Elevated	0 of 6	0.8%	9	17	0	1	0	1	0
Region 2	Elevated	3 of 4	1.3%	20	55	2	0	0	8	0
Region 3	Elevated	1 of 6	1.1%	13	23	12	2	16	2	0
Region 4	Elevated	1 of 8	5.1%	7	27	9	0	0	25	3
Region 5	Normal	0 of 6	0.9%	72	34	11	1	10	4	0
Region 6	Elevated	1 of 5	1.4%	2	21	0	1	2	11	1
Region 7	Normal	0 of 4	0.8%	6	23	1	2	1	1	0
Region 8	Elevated	0 of 6	2.4%	68	35	1	3	17	3	0
Region 9	Elevated	0 of 4	3.2%	72	143	7	9	20	48	2
Region 10	Normal	0 of 4	3.0%	21	59	1	3	7	12	0

*http://www.hhs.gov/about/agencies/staff-divisions/iea/regional-offices/index.html
† Elevated means the % of visits for ILI is at or above the national or region-specific baseline.
§ Includes all 50 states, New York City, the District of Columbia, and Puerto Rico
‡ National data are for current week; regional data are for the most recent three weeks.

U.S. Virologic Surveillance: WHO and NREVSS collaborating laboratories, which include both public health and clinical laboratories located in all 50 states, Puerto Rico, and the District of Columbia, report to CDC the total number of respiratory specimens tested for influenza and the number positive for influenza by virus type. In addition, public health laboratories also report the influenza A subtype (H1 or H3) and influenza B lineage information of the viruses they test and the age or age group of the persons from whom the specimens were collected.

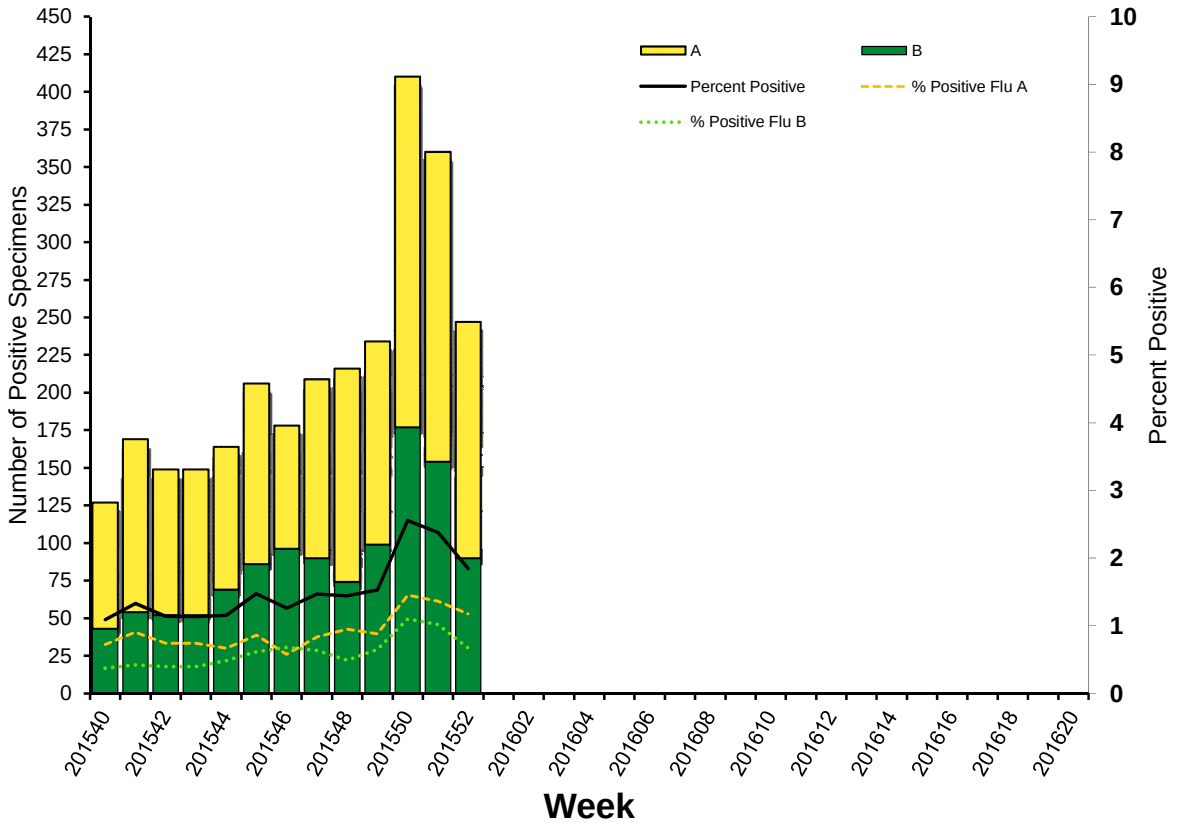
Beginning in the 2015-2016 influenza season, reports from public health and clinical laboratories are presented separately in both FluView and FluView Interactive. Influenza testing practices differ in public health and clinical laboratories but both sources provide valuable information for monitoring influenza activity. Clinical laboratories primarily test respiratory specimens for diagnostic purposes and data from these laboratories provide useful information on the timing and intensity of influenza activity. Public health laboratories primarily test specimens for surveillance purposes to understand what influenza viruses are circulating throughout their jurisdiction and the population groups being affected. However, in order to obtain enough specimens to produce this detailed information in an efficient manner, public health laboratories often receive samples that have already tested positive for influenza at a clinical laboratory. Because of this, monitoring the percent of specimens testing positive for influenza in a public health laboratory is less useful, but fortunately, is not necessary when clinical laboratory data is available.

Additional data are available at http://gis.cdc.gov/grasp/fluview/fluportaldashboard.html.

The results of tests performed by clinical laboratories are summarized below.

	Week 52	Data Cumulative since October 4, 2015 (week 40)
No. of specimens tested	13,373	181,844
No. of positive specimens (%)	247 (1.8%)	2,818 (1.5%)
Positive specimens by type		
Influenza A	157 (63.6%)	1,682 (59.7%)
Influenza B	90 (36.4%)	1,136 (40.3%)

Influenza Positive Tests Reported to CDC by U.S. Clinical Laboratories, National Summary, 2015-2016 Season

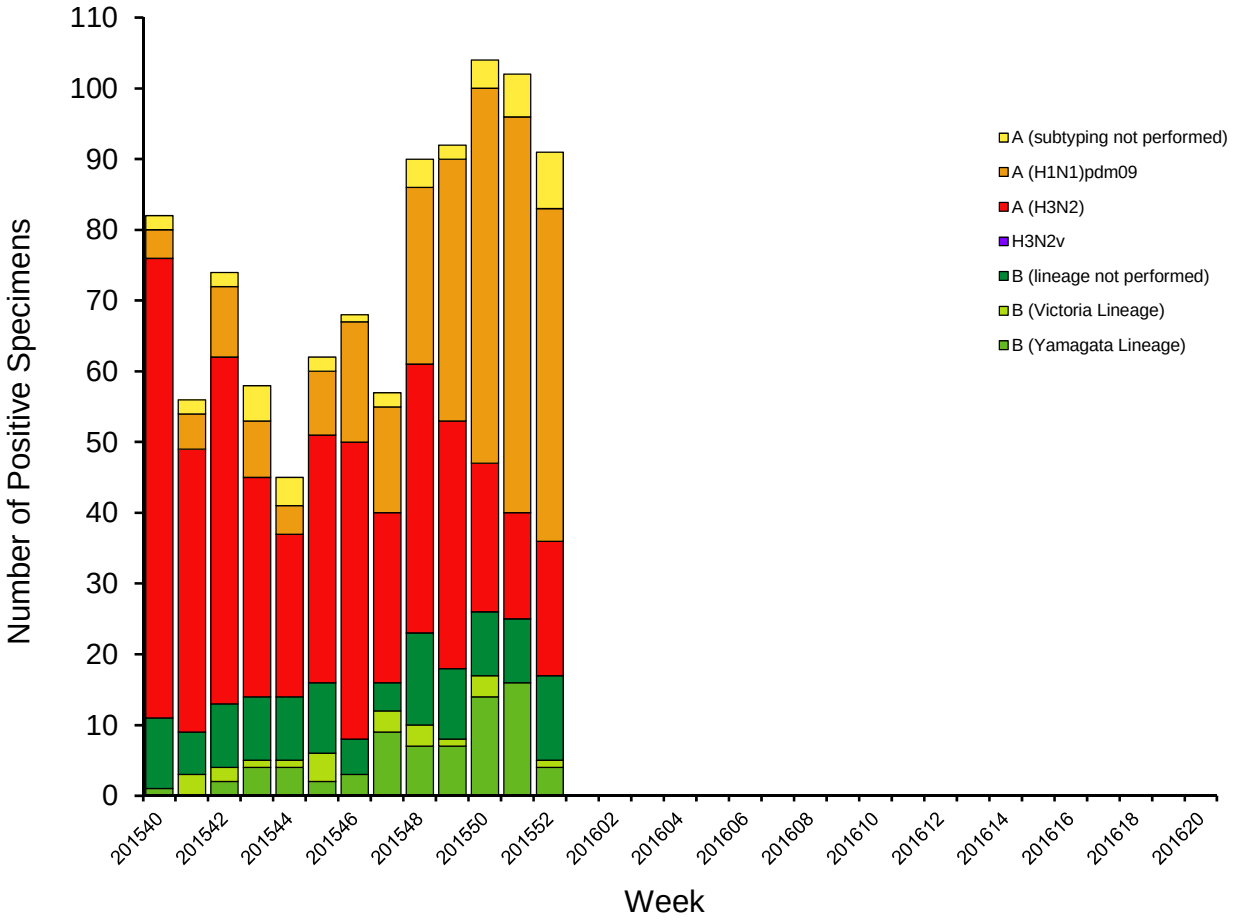


The results of tests performed by public health laboratories, as well as the age group distribution of influenza positive tests, are summarized below.

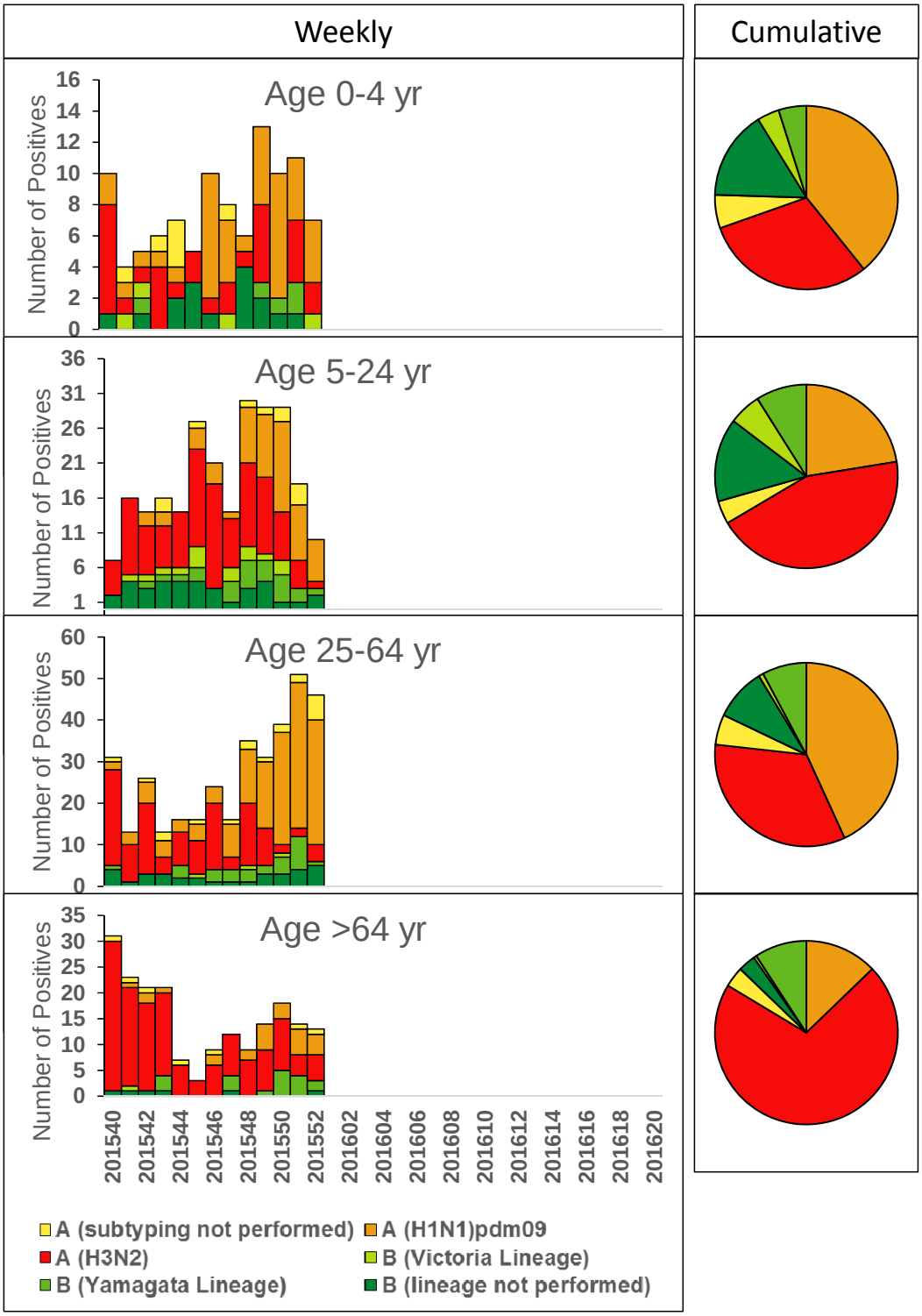
	Week 52	Data Cumulative since October 4, 2015 (week 40)
No. of specimens tested	759	15,658
No. of positive specimens*	91	981
Positive specimens by type/subtype		
Influenza A	74 (81.3%)	771 (78.6%)
A(H1N1)pmd09	47 (63.5%)	290 (37.6%)
H3	19 (25.7%)	437 (56.7%)
Subtyping not performed	8 (10.8%)	44 (5.7%)
Influenza B	17 (18.7%)	210 (21.4%)
Yamagata lineage	4 (23.5%)	73 (34.8%)
Victoria lineage	1 (5.9%)	22 (10.5%)
Lineage not performed	12 (70.6%)	115 (54.8%)

*Percent positive not reported because public health laboratories often receive samples that have already tested positive for influenza at a clinical laboratory and therefore percent positive would not be a valid indicator of influenza activity

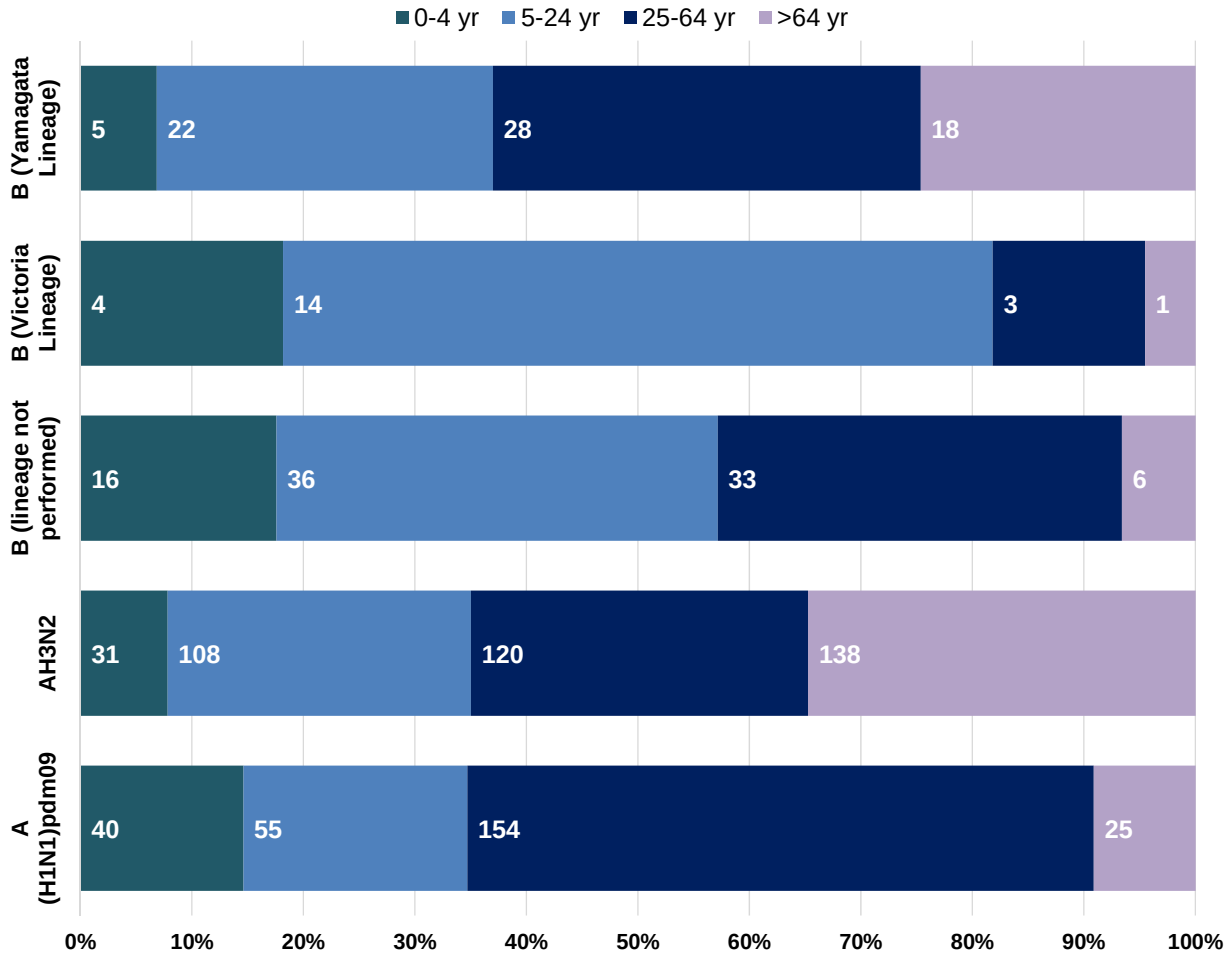
Influenza Positive Tests Reported to CDC by U.S. Public Health Laboratories, National Summary, 2015-2016 Season



Age Group Distribution of Influenza Positive Specimens Reported by Public Health Laboratories, National Summary, 2015-2016 Season



Age Group Proportions and Total by Influenza Subtype Reported by Public Health Laboratories, 2015-2016 Season



Novel Influenza A Virus: One human infection with a novel influenza A virus was reported by the state of New Jersey. The person was infected with an influenza A (H3N2) variant (H3N2v) virus. The patient was not hospitalized and has fully recovered from their illness. The patient visited a farm near where swine are frequently housed but no direct contact with swine was reported in the week prior to illness onset. No ongoing human-to-human transmission has been identified.

Early identification and investigation of human infections with novel influenza A viruses are critical so that the risk of infection can be more fully appreciated and appropriate public health measures can be taken. Additional information on influenza in swine, variant influenza infection in humans, and strategies to interact safely with swine can be found at http://www.cdc.gov/flu/swineflu/index.htm.

Influenza Virus Characterization: CDC characterizes influenza viruses through one or more tests including genome sequencing, hemagglutination inhibition (HI), and/or neutralization assays. These data are used to compare how similar currently circulating influenza viruses are to the reference viruses used for developing influenza vaccines, and to monitor for changes in circulating influenza viruses. Historically, HI data have been used most commonly to assess the similarity between reference viruses and circulating viruses to suggest how well the vaccine may work until such time as vaccine effectiveness estimates are available. During the 2014–2015 season and to date this season, however, a portion of influenza A (H3N2) viruses do not yield sufficient hemagglutination titers for antigenic characterization by HI. For many of these viruses, CDC performs genetic characterization to determine the genetic group identity of those viruses. In this way, antigenic properties of these viruses can be inferred from viruses within the same genetic group that have been characterized antigenically.

CDC has characterized 192 influenza viruses [49 A (H1N1)pdm09, 119 A (H3N2), and 24 influenza B viruses] collected by U.S. laboratories **since October 1, 2015**.

Influenza A Virus [168]

- **A (H1N1)pdm09 [49]:** All 49 (100%) influenza A (H1N1)pdm09 viruses were antigenically characterized as A/California/7/2009-like, the influenza A (H1N1) component of the 2015-2016 Northern Hemisphere vaccine.

- **A (H3N2) [119]:** All 119 H3N2 viruses were genetically sequenced and all viruses belonged to genetic groups for which a majority of viruses antigenically characterized were similar to the cell-propagated A/Switzerland/9715293/2013, the influenza A (H3N2) reference virus representing the 2015-2016 Northern Hemisphere vaccine component.
    - A subset of 74 H3N2 viruses also were antigenically characterized; 73 of 74 (98.6%) H3N2 viruses were A/Switzerland/9715293/2013-like by HI testing or neutralization testing.

Influenza B Virus [24]

- **Yamagata Lineage [17]:** All 17 (100%) B/Yamagata-lineage viruses were antigenically characterized as B/Phuket/3073/2013-like, which is included as an influenza B component of the 2015-2016 Northern Hemisphere trivalent and quadrivalent influenza vaccines.

- **Victoria Lineage [7]:** All seven (100%) B/Victoria-lineage viruses were antigenically characterized as B/Brisbane/60/2008-like, which is included as an influenza B component of the 2015-2016 Northern Hemisphere quadrivalent influenza vaccines.

Antiviral Resistance: Testing of influenza A(H1N1)pdm09, A(H3N2), and influenza B virus isolates for resistance to neuraminidase inhibitors (oseltamivir, zanamivir, and peramivir) is performed at CDC using a functional assay. Additional A(H1N1)pdm09 and A(H3N2) clinical samples are tested for mutations of the virus known to confer oseltamivir resistance. The data summarized below combine the results of both testing methods. These samples are routinely obtained for surveillance purposes rather than for diagnostic testing of patients suspected to be infected with antiviral-resistant virus.

High levels of resistance to the adamantanes (amantadine and rimantadine) persist among A(H1N1)pdm09 and A(H3N2) viruses (the adamantanes are not effective against influenza B viruses). Therefore, data from adamantane resistance testing are not presented below.

Neuraminidase Inhibitor Resistance Testing Results on Samples Collected Since October 1, 2015

	Oseltamivir		Zanamivir		Peramivir	
	Virus Samples tested (n)	Resistant Viruses, Number (%)	Virus Samples tested (n)	Resistant Viruses, Number (%)	Virus Samples tested (n)	Resistant Viruses, Number (%)
Influenza A(H1N1)pmd09	46	1 (2.2)	46	0 (0.0)	46	1 (2.2)
Influenza A (H3N2)	145	0 (0.0)	145	0 (0.0)	145	0 (0.0)
Influenza B	41	0 (0.0)	41	0 (0.0)	41	0 (0.0)

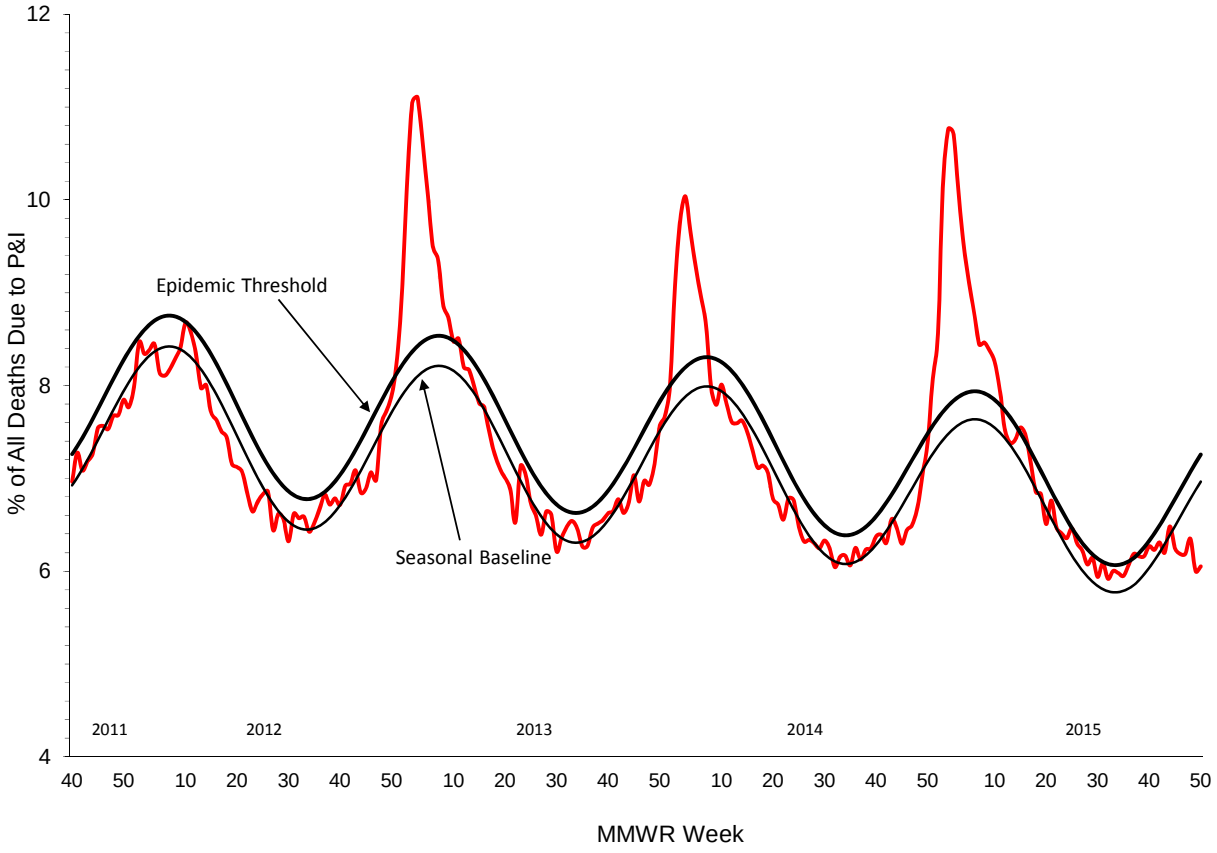
The majority of recently circulating influenza viruses are susceptible to the neuraminidase inhibitor antiviral medications, oseltamivir, zanamivir, and peramivir; however, rare sporadic instances of oseltamivir-resistant and peramivir-resistant influenza A (H1N1)pdm09 and oseltamivir-resistant influenza A (H3N2) viruses have been detected worldwide. Antiviral treatment as early as possible is recommended for patients with confirmed or suspected influenza who have severe, complicated, or progressive illness; who require hospitalization; or who are at high risk for serious influenza-related complications. Additional information on recommendations for treatment and chemoprophylaxis of influenza virus infection with antiviral agents is available at http://www.cdc.gov/flu/antivirals/index.htm.

Pneumonia and Influenza (P&I) Mortality Surveillance: Rapid tracking of pneumonia and influenza-associated deaths is done through two systems, the National Center for Health Statistics (NCHS) Mortality Surveillance System and the 122 Cities Mortality Reporting System. NCHS mortality surveillance data are presented by the week the death occurred and P&I percentages are released two weeks after the week of death to allow for collection of enough data to produce a stable P&I percentage. Users of the data should not expect the two systems to produce the same percentages, and the percent P&I deaths from each system should be compared to the corresponding system-specific baselines and thresholds.

NCHS Mortality Surveillance Data:
Based on NCHS mortality surveillance data available on January 7, 2016, 6.1% of the deaths occurring during the week ending December 19, 2015 (week 50) were due to P&I. This percentage is below the epidemic threshold of 7.3% for week 50.

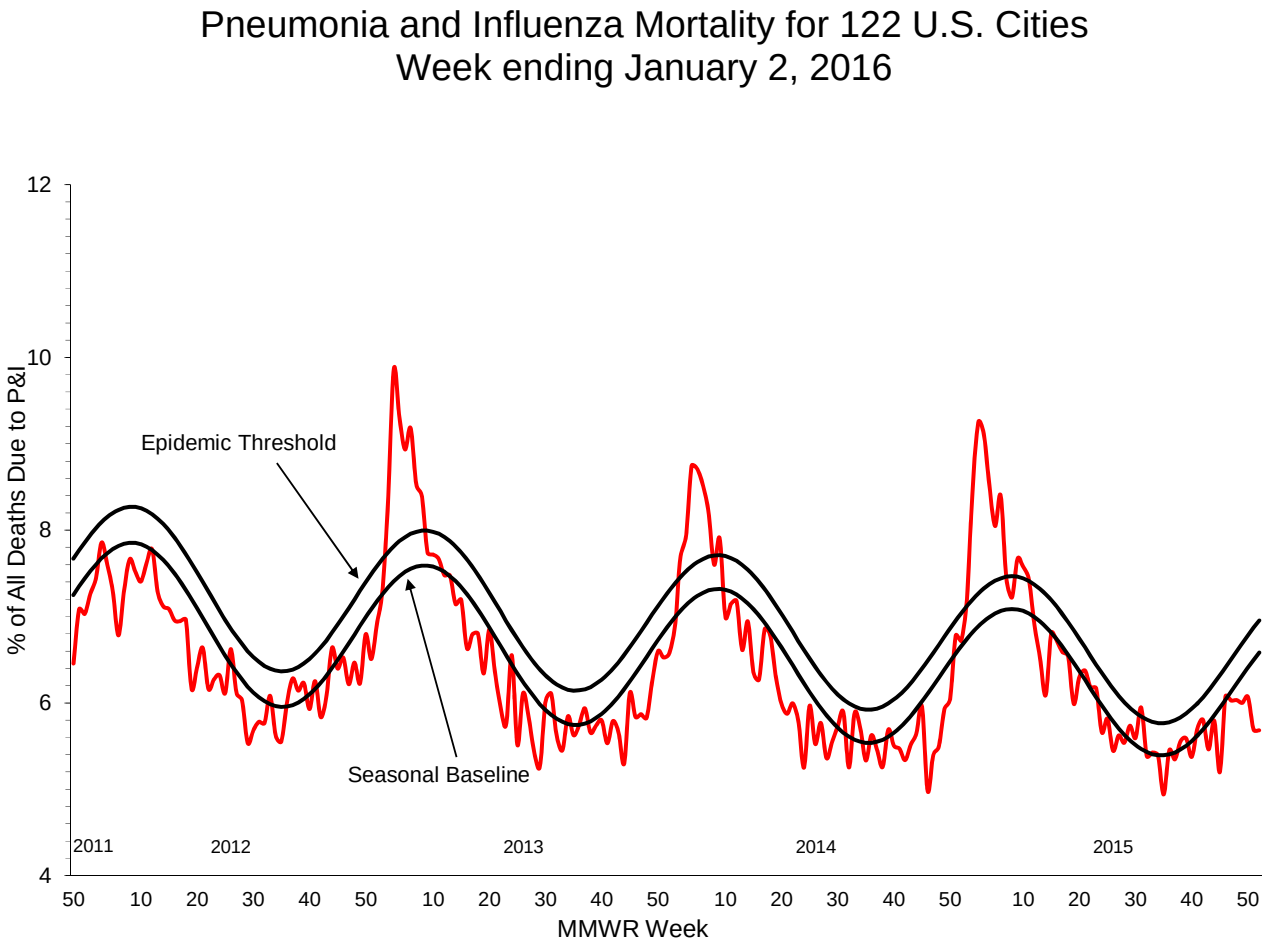
Region and state-specific data are available at http://www.cdc.gov/flu/weekly/nchs.htm.

Pneumonia and Influenza Mortality from the National Center for Health Statistics Mortality Surveillance System
Data through the week ending December 19, 2015, as of January 7, 2016



122 Cities Mortality Reporting System

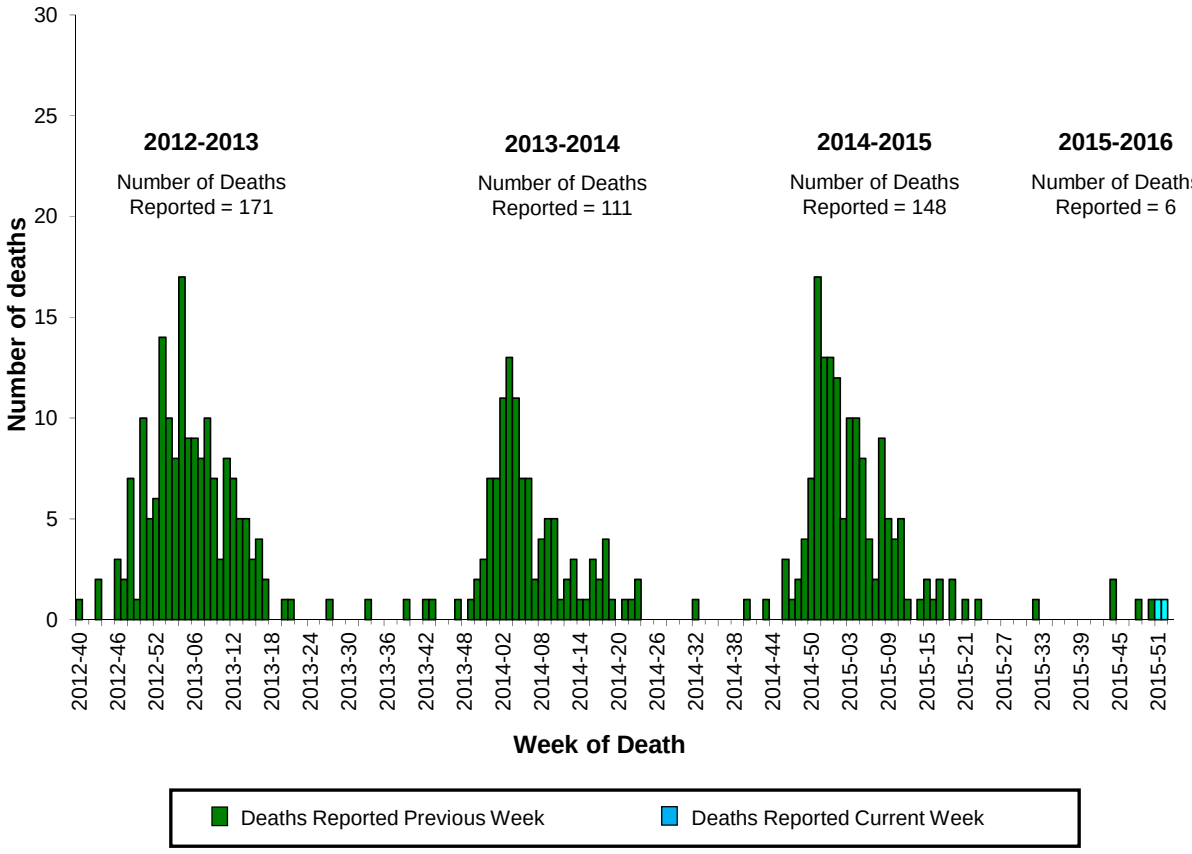
During week 52, 5.7% of all deaths reported through the 122 Cities Mortality Reporting System were due to P&I. This percentage was below the epidemic threshold of 7.0% for week 52.



Influenza-Associated Pediatric Mortality: Two influenza-associated pediatric deaths were reported to CDC during week 52. One death was associated with an influenza A (H3) virus and occurred during week 51 (the week ending December 26, 2015) and one death was associated with an influenza A (H1N1)pdm09 virus and occurred during week 52 (the week ending January 2, 2016). A total of six influenza-associated pediatric deaths have been reported during the 2015-2016 season.

Additional data can be found at: http://gis.cdc.gov/GRASP/Fluview/PedFluDeath.html.

Number of Influenza-Associated Pediatric Deaths by Week of Death: 2012-2013 season to present



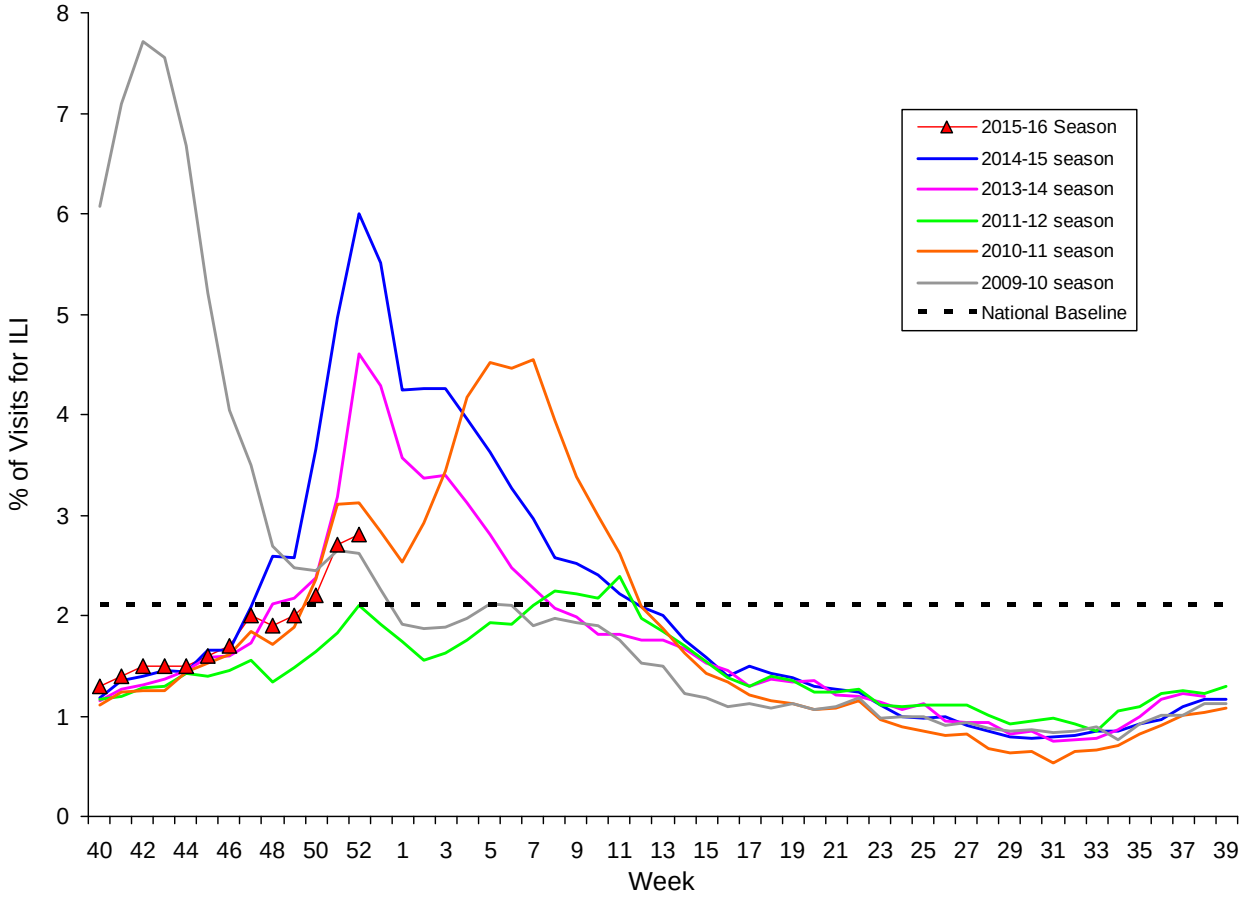
Influenza-Associated Hospitalizations: The Influenza Hospitalization Surveillance Network (FluSurv-NET) conducts all age population-based surveillance for laboratory-confirmed influenza-related hospitalizations in select counties in the Emerging Infections Program (EIP) states and Influenza Hospitalization Surveillance Project (IHSP) states. FluSurv-NET estimated hospitalization rates will be updated weekly starting later this season. Additional FluSurv-NET data can be found at: http://gis.cdc.gov/GRASP/Fluview/FluHospRates.html and http://gis.cdc.gov/grasp/fluview/FluHospChars.html.

Outpatient Illness Surveillance: Nationwide during week 52, 2.8% of patient visits reported through the U.S. Outpatient Influenza-like Illness Surveillance Network (ILINet) were due to influenza-like illness (ILI). This percentage is above the national baseline of 2.1%. *(ILI is defined as fever (temperature of 100°F [37.8°C] or greater) and cough and/or sore throat.)*

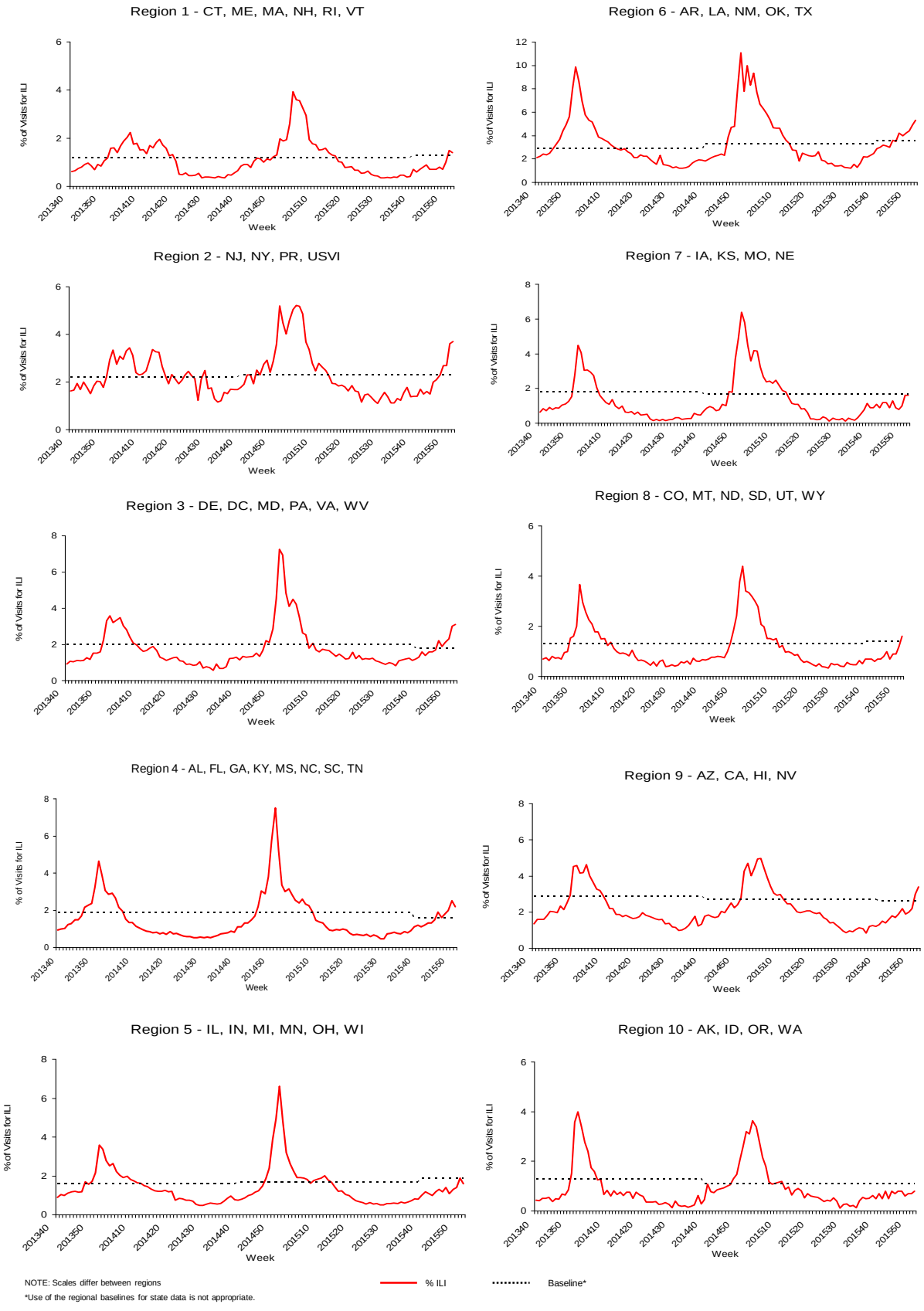
The increase in the percentage of patient visits for ILI may be influenced in part by a reduction in routine healthcare visits during the holidays, as has occurred in previous seasons.

Additional data are available at http://gis.cdc.gov/grasp/fluview/fluportaldashboard.html.

Percentage of Visits for Influenza-like Illness (ILI) Reported by the U.S. Outpatient Influenza-like Illness Surveillance Network (ILINet), Weekly National Summary, 2015-2016 and Selected Previous Seasons



On a regional level, the percentage of outpatient visits for ILI ranged from 0.8% to 5.3% during week 52. Seven regions (Regions 1, 2, 3, 4, 6, 8, and 9) reported a proportion of outpatient visits for ILI at or above their region-specific baseline levels.

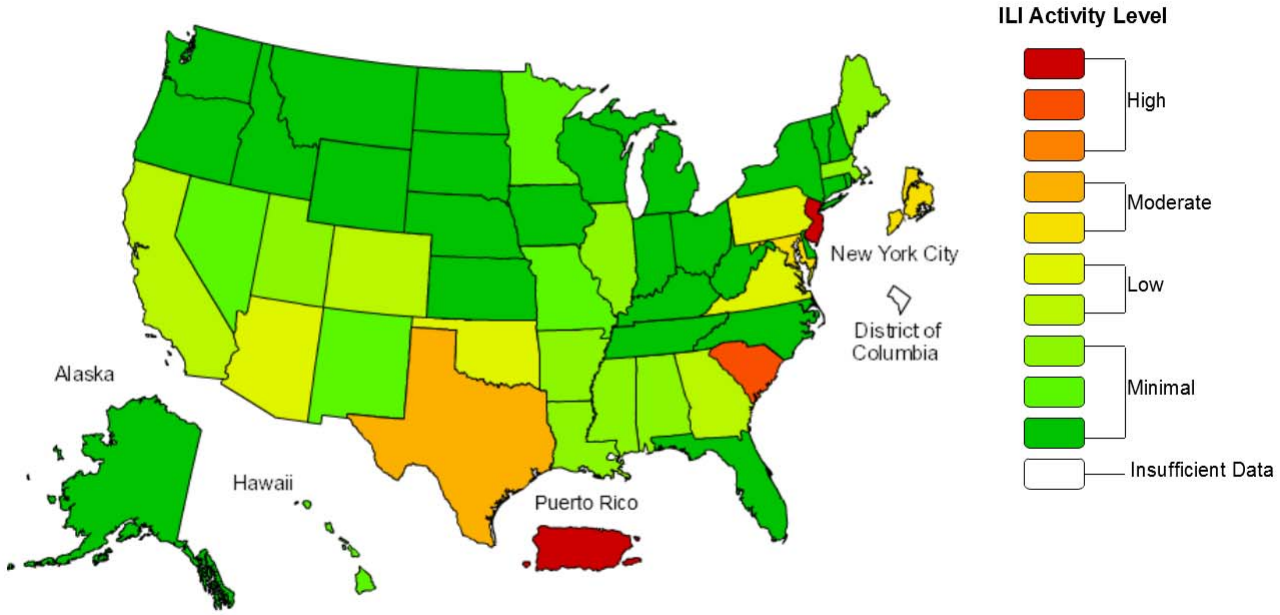

Region 1 - CT, ME, MA, NH, RI, VT
Region 6 - AR, LA, NM, OK, TX
Region 2 - NJ, NY, PR, USVI
Region 7 - IA, KS, MO, NE
Region 3 - DE, DC, MD, PA, VA, WV
Region 8 - CO, MT, ND, SD, UT, WY
Region 4 - AL, FL, GA, KY, MS, NC, SC, TN
Region 9 - AZ, CA, HI, NV
Region 5 - IL, IN, MI, MN, OH, WI
Region 10 - AK, ID, OR, WA
% of Visits for ILI
Week
NOTE: Scales differ between regions
% ILI
Baseline*
*Use of the regional baselines for state data is not appropriate.

ILINet State Activity Indicator Map: Data collected in ILINet are used to produce a measure of ILI activity* by state. Activity levels are based on the percent of outpatient visits in a state due to ILI and are compared to the average percent of ILI visits that occur during weeks with little or no influenza virus circulation. Activity levels range from minimal, which would correspond to ILI activity from outpatient clinics being below, or only slightly above, the average, to high, which would correspond to ILI activity from outpatient clinics being much higher than average.

During week 52, the following ILI activity levels were experienced:

- Puerto Rico and two states (New Jersey and South Carolina) experienced high ILI activity.
- New York City and two states (Maryland and Texas) experienced moderate ILI activity.
- Seven states (Arizona, California, Colorado, Georgia, Oklahoma, Pennsylvania, and Virginia) experienced low ILI activity.
- 39 states (Alabama, Alaska, Arkansas, Connecticut, Delaware, Florida, Hawaii, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Mexico, New York, North Carolina, North Dakota, Ohio, Oregon, Rhode Island, South Dakota, Tennessee, Utah, Vermont, Washington, West Virginia, Wisconsin, and Wyoming) experienced minimal ILI activity.
- Data were insufficient to calculate an ILI activity level from the District of Columbia.

Influenza-Like Illness (ILI) Activity Level Indicator Determined by Data Reported to ILINet
2015-16 Influenza Season Week 52 ending Jan 02, 2016

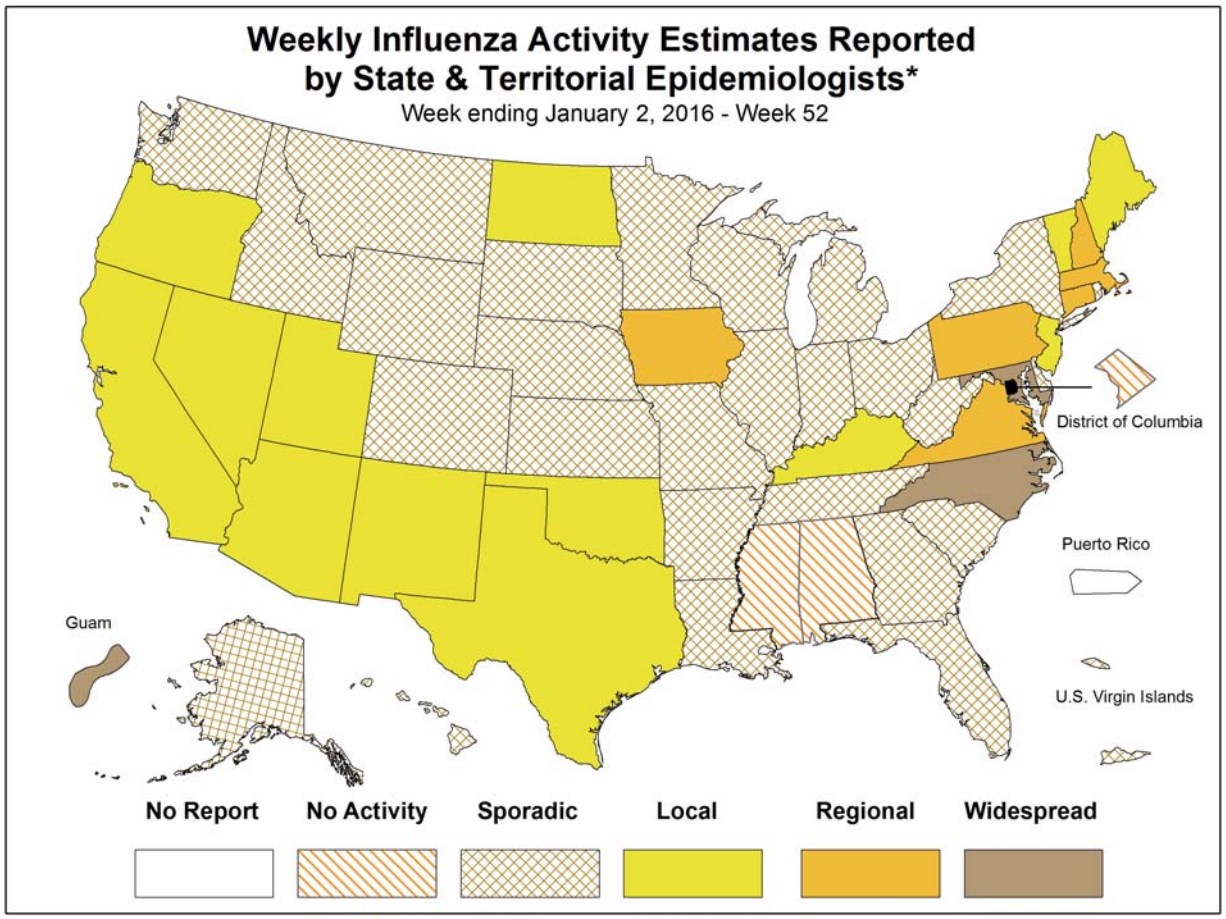


*This map uses the proportion of outpatient visits to health care providers for influenza-like illness to measure the ILI activity level within a state. It does not, however, measure the extent of geographic spread of flu within a state. Therefore, outbreaks occurring in a single city could cause the state to display high activity levels.
Data collected in ILINet may disproportionally represent certain populations within a state, and therefore, may not accurately depict the full picture of influenza activity for the whole state.
Data displayed in this map are based on data collected in ILINet, whereas the State and Territorial flu activity map is based on reports from state and territorial epidemiologists. The data presented in this map is preliminary and may change as more data is received.
Differences in the data presented here by CDC and independently by some state health departments likely represent differing levels of data completeness with data presented by the state likely being the more complete.

Geographic Spread of Influenza as Assessed by State and Territorial Epidemiologists: The influenza activity reported by state and territorial epidemiologists indicates geographic spread of influenza viruses, but does not measure the severity of influenza activity.

During week 52, the following influenza activity was reported:

- Widespread influenza activity was reported by Guam and two states (Maryland and North Carolina).
- Regional influenza activity was reported by six states (Connecticut, Iowa, Massachusetts, New Hampshire, Pennsylvania, and Virginia).
- Local influenza activity was reported by 13 states (Arizona, California, Kentucky, Maine, Nevada, New Jersey, New Mexico, North Dakota, Oklahoma, Oregon, Texas, Utah, and Vermont).
- Sporadic influenza activity was reported by the U.S. Virgin Islands and 27 states (Alaska, Arkansas, Colorado, Delaware, Florida, Georgia, Hawaii, Idaho, Illinois, Indiana, Kansas, Louisiana, Michigan, Minnesota, Missouri, Montana, Nebraska, New York, Ohio, Rhode Island, South Carolina, South Dakota, Tennessee, Washington, West Virginia, Wisconsin, and Wyoming).
- No influenza activity was reported by the District of Columbia and two states (Alabama and Mississippi).
- Puerto Rico did not report.



* This map indicates geographic spread & does not measure the severity of influenza activity

Additional National and International Influenza Surveillance Information

FluView Interactive: FluView includes enhanced web-based interactive applications that can provide dynamic visuals of the influenza data collected and analyzed by CDC. These FluView Interactive applications allow people to create customized, visual interpretations of influenza data, as well as make comparisons across flu seasons, regions, age groups and a variety of other demographics. To access these tools, visit http://www.cdc.gov/flu/weekly/fluviewinteractive.htm.

U.S. State, territorial, and local influenza surveillance: Click on a jurisdiction below to access the latest local influenza information.

Alabama	Alaska	Arizona	Arkansas	California
Colorado	Connecticut	Delaware	District of Columbia	Florida
Georgia	Hawaii	Idaho	Illinois	Indiana
Iowa	Kansas	Kentucky	Louisiana	Maine
Maryland	Massachusetts	Michigan	Minnesota	Mississippi
Missouri	Montana	Nebraska	Nevada	New Hampshire
New Jersey	New Mexico	New York	North Carolina	North Dakota
Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island
South Carolina	South Dakota	Tennessee	Texas	Utah
Vermont	Virginia	Washington	West Virginia	Wisconsin
Wyoming	New York City	Puerto Rico	U.S. Virgin Islands	

World Health Organization: Additional influenza surveillance information from participating WHO member nations is available through FluNet and the Global Epidemiology Reports.

WHO Collaborating Centers for Influenza located in Australia, China, Japan, the United Kingdom, and the United States (CDC in Atlanta, Georgia).

Europe: For the most recent influenza surveillance information from Europe, please see WHO/Europe and the European Centre for Disease Prevention and Control at http://www.flunewseurope.org/

Public Health Agency of Canada: The most up-to-date influenza information from Canada is available at http://www.phac-aspc.gc.ca/fluwatch/.

Public Health England: The most up-to-date influenza information from the United Kingdom is available at https://www.gov.uk/government/statistics/weekly-national-flu-reports.

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An overview of the CDC influenza surveillance system, including methodology and detailed descriptions of each data component, is available at: http://www.cdc.gov/flu/weekly/overview.htm.

Report prepared: January 8, 2016.